

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LONDON.—In consequence of the incorporation of University College in the University, certain professors of the college will in future be entitled professors in the University of London, and will enjoy the status of appointed teachers. These include Profs. Trouton (physics), Oliver (botany), Hill (zoology), Starling (physiology), Thane (anatomy), Cushny (pharmacology), and Cormack (mechanical engineering). Sir William Ramsay, K.C.B. (general chemistry), and Prof. Norman Collie (organic chemistry) have been appointed teachers of the University for some years.

The announcement that the governing body of the Imperial College of Science and Technology at South Kensington has decided in principle on the appointment of a principal officer of the college has been received with much interest. The post will be an important one, as the resources of the college are considerable, and great developments are expected during the next few years. It is a curious coincidence that two principal officers should be required at the same time at South Kensington, the one at the University and the other at the Imperial College.

Among the advanced lectures in science to be delivered, in connection with the University, during the first term of this year are the following:—A course of eight lectures on "Grasses: their Structure, Biology, Distribution, and Classification," by Dr. Otto Stapf, at University College, on Mondays, beginning on January 27. Eight lectures on "Intracellular Enzymes," by Dr. H. M. Vernon, at the University Physiological Laboratory, on Tuesdays, beginning on January 14. Eight lectures on "The Chemical Constitution of the Proteins," by Dr. R. H. Aders Plimmer, at University College, on Wednesdays, beginning on January 22. Eight lectures on "The Chemistry of the Fats and Carbohydrates and some other Constituents of the Animal Body," by Dr. S. B. Schryver, at University College, on Fridays, beginning on January 24. Four lectures on "Tissue Respiration," by Dr. T. G. Brodie, F.R.S., at King's College, on Mondays, beginning on January 20. Two lectures on "The Physiology of the Emotions," by Dr. F. W. Mott, F.R.S., at King's College, on Mondays, beginning on February 17. Two lectures on "Degeneration and Regeneration of Nerves," by Prof. W. D. Halliburton, F.R.S., at King's College, on Mondays, beginning on March 2. Eight lectures on "The Physiology of Muscular Work," by Dr. M. S. Pembrey, at Guy's Hospital Medical School, on Thursdays, beginning on January 16. Eight lectures on "Inheritance in its Physiological and Pathological Aspects," by Dr. W. Bulloch, and Messrs. G. P. Mudge, M. Greenwood, and A. Bacot, at the London Hospital Medical College, on Wednesdays, beginning on January 15. Four lectures on "The Circulatory System of Reptiles," by Mr. F. E. Beddard, F.R.S., at University College, on Mondays, beginning on January 20. The reader in meteorology, Dr. W. N. Shaw, F.R.S., will resume his lectures on "Meteorological Organisation and Methods of dealing with Meteorological Observations," at the Royal College of Science, on Monday, January 13.

By the death, on December 24, of Lady Pearce, widow of Sir William G. Pearce, Trinity College, Cambridge, becomes entitled to a sum of more than 400,000*l*.

We learn from *Science* that the National Educational Association of the United States has appointed a representative committee to investigate the entrance requirements to the technical schools of the country, and to consider the question of establishing uniform entrance requirements.

THE annual meeting of the Geographical Association will be held at 3 p.m. on Wednesday, January 8, at University College, Gower Street, W.C. The president, Mr. Douglas W. Freshfield, will give an address, Major C. F. Close will deliver a lecture on map projections, and there will be a lantern exhibition of views of the Rhine Gorge by Mr. B. B. Dickinson.

THE Incorporated Association of Headmasters will hold its annual general meeting on January 9 and 10 at the

Guildhall, E.C. The agenda paper is mainly occupied with administrative questions, and we observe that a committee is suggested for considering the medical inspection of pupils attending secondary schools. The University of London and the northern universities are urged to come to terms for the mutual recognition of their matriculation certificates. Mr. E. J. Simpson will move a resolution in favour of the inclusion of a paper on elementary physics amongst the optional papers of the northern matriculation.

At the winter meeting of the College of Preceptors, lectures will be given on a rational comparative method of teaching geography, by Dr. Herbertson, on January 7 and 8, and the subject of geometry will be dealt with by Mr. J. Harrison, of the Royal College of Science, on January 15. During the course of the meeting there will be several lectures on psychology, personal hygiene, and the use of the voice.

SOCIETIES AND ACADEMIES.

LONDON.

Faraday Society, December 17, 1907.—Dr. F. Mollwo Perkin, treasurer, in the chair.—A physico-chemical study of the complex copper glycol sulphates: J. T. Barker. The paper deals with the constitution of the blue solution formed when glycol is added to copper sulphate solution. It is probable that the concentration of the cuprions has been lowered by the formation of complex cupri-glycol kations, and experiments are described to investigate this question.—The discovery of the alkali metals by Davy: the bearing of the discovery upon industry: Dr. F. Mollwo Perkin. After a short biographical sketch, the author refers to Davy's early experiments on galvanism, which began in 1800 and culminated in 1807 in the electrolytic decomposition of the fused alkalis, caustic soda, and caustic potash. Davy's experiments are described in detail, and it is shown that the E.M.F. of his battery must have been about 220 volts, and the current he used something under 1 ampere. The subsequent experiments on the decomposition of the alkaline earths, by which calcium, strontium, barium, and magnesium in the form of amalgams were obtained, are then described. The second part of the paper deals, among other matters, with the industrial manufacture by Wöhler in 1827 of potassium, by Ste. Claire Deville in 1854 of sodium, with Watt's suggestions (1851) for electrolysis of fused sodium chloride, with Castner's chemical sodium process (1886) and his electrolytic process (1890), Rathenau and Suter's sodium process, Becker's process, and the process of Darling, who electrolysed fused sodium nitrate, using porous partitions.

Geological Society, December 18, 1907.—Sir Archibald Geikie, K.C.B., Sec.R.S., president, in the chair.—Some recent discoveries of Palæolithic implements: Sir John Evans.—The author refers to some recent discoveries of Palæolithic implements on the southern borders of Bedfordshire and in the north-western part of Hertfordshire. In addition to the discovery of a Palæolithic floor at Caddington brickfield, at between 550 and 590 feet above sea-level, implements have since been found on the surface of the ground at 600 and 760 feet respectively; while a good ovate implement was found in thin, water-laid material, at 651 feet O.D. In Hertfordshire, Palæolithic implements have been found at Great Gaddesdon, at a brickfield about 1½ miles north-east of Hemel Hempstead, and at Bedmond, 2 to 2½ miles south-east of the last locality. The drifts which cap the hills in north-west Hertfordshire seem to be of very variable origin; and a great part of the material is derived from clay-deposits of Eocene age, but little *remanies*. It seems to the author that it is safest not to invoke river-action for the formation of the high-level deposits, which extend over a wide area and are in the main argillaceous and not gravelly or sandy in character, but to adopt Mr. Worthington Smith's view that in early times lakes or marshes existed in these implementiferous spots, the borders of which were inhabited by Palæolithic man. The evidence that he has brought forward as to the implements having, in some of the Caddington pits, been manufactured on the spot, most fully corroborates this

view.—A deep channel of Drift at Hitchin (Hertfordshire): W. Hill. Evidence is given, from nine borings running along a line slightly west of north from Langley through Hitchin, of the existence of a channel of considerable depth, now filled with Drift, occupying the centre of an old valley in the Chalk-escarpment, which may be called the Hitchin Valley.

PARIS.

Academy of Sciences, December 16, 1907.—M. A. Chauveau in the chair.—The action of nitrous acid upon allylamine: Louis Henry. The interaction of allylamine hydrochloride and sodium nitrite gives allyl alcohol only. Acetone was looked for, but no trace of any isomer appears to be formed in this reaction.—Report by M. Bertin upon a memoir entitled "The Study of the Movements of Water which can be produced in Contact and in the Neighbourhood of a Plane Vertical Wall," by MM. Fortant and Le Besnerais.—Observations of the phenomena of Saturn's ring made with the bent equatorial of 32 cm. aperture at the Observatory of Lyons: J. Guillaume.—Laplace's transformation and persistent conjugate systems: D. Th. Egoroff.—The theory of matrices: M. de Séguier.—Infinitesimal transformations and adjoint functions: N. Saltykow.—Differential equations of the third order with fixed critical points: J. Chazy.—Flame spectra obtained by the electrical method: G. A. Hemsalech and C. de Watteville. The present paper deals with an application of a process previously described, and is especially adapted for the examination of salts of the rare earths. The salt is incorporated with either boric acid or a mixture of asbestos and sodium silicate, and the whole placed in the hollow of a carbon rod forming the positive pole of an electric arc, the arc being enclosed in a glass globe. A current of air is led into this vessel, and is then allowed to flow to the burner. Finely divided particles of the salt are thus introduced into the flame of a Bunsen burner, and 1 gram of the salt is sufficient to show the flame spectrum for five hours continuously.—The Audiffren refrigerator: MM. Audiffren and Singrün. A suitable gas is liquefied in the compressor, and the liquid allowed to evaporate in the refrigerator, the special advantage of the arrangement (a diagram of which is given) being that both the compressor and refrigerator are enclosed in an air-tight vessel, only a single stuffing box carrying the pulley through which the whole is driven communicating with the outside air. The pump is driven by the action of gravity on a heavy piston, and it is impossible for the pressure to rise above a figure fixed by the weight of the piston.—Phosphorescence at low temperatures: Joseph de Kowalski. Solutions of nitrates of the rare earths in alcohol become strongly fluorescent at the temperature of liquid air. For the erbium solution the tint is green, greenish-yellow for the samarium solution, and violet for the solution of nitrate of neodymium. Alcoholic solutions of phenanthrene, anthracene, and anthraquinone behave similarly. In all cases the substance was previously exposed to a strong ultra-violet light from a quartz mercury arc lamp.—The formation of ozone by the action of the silent discharge at low temperatures: E. Briner and E. Durand. At the temperature of liquid air the vapour pressure of liquid ozone is practically zero, and it has been found possible integrally to transform oxygen into ozone. For a given expenditure of electrical energy the maximum yield of ozone was obtained with a pressure of oxygen of 100 mm. of mercury. The authors point out that the dangers of explosion of the liquid ozone are much reduced if care is taken to remove all traces of grease from the ozoniser by washing with chromic acid mixture before use.—The hydrolysis of iron perchloride. The function of hydrochloric acid: G. Maifano and L. Michel. The experiments described by the authors appear to be best explained by the hypothesis that the constitution of the colloid is formed at the expense of the products of hydrolysis or of complex ions.—The solubility of graphite in iron: Georges Charpy. The results given in this paper form an additional argument for considering that the solubility of graphite in iron decreases regularly with the temperature, and give a value of 1 per cent. as the most probable value for the solu-

bility in pure iron at 1000° C.—An attempt at proving certain relations between the atomic weights of the elements: M. Delauney. The values of the atomic weights may be represented in the form A^2/n , where A and n are two whole numbers.—The gases occluded in steels: G. Belloc. The amounts of gas given off are in close relation with the critical points of iron. The gases consist of carbon dioxide, carbon monoxide, hydrogen and nitrogen, and each gas is characterised by a particular temperature of evolution. The distribution of the gases is very irregular in the different layers of the metal.—The extraction of the gases contained in metals: O. Boudouard. It is an extremely difficult matter to extract the whole of the gases contained in iron and steel, a third heating to 1100° C. in a vacuum still yielding some gas. The accidental breakage of a porcelain tube in these experiments showed that iron clearly commences to volatilise in a vacuum at 900° C., this effect being quite marked at 1100° C.—The qualitative examination of ciders for tartaric acid: G. A. Le Roy. The method is based on a colour reaction with a solution of resorcinol and sulphuric acid.—Syntheses by means of the mixed organo-metallic derivatives of zinc. The constitution of the β -acetoxyketones: E. E. Blaise.—The preparation of the cyanides of methyl and ethyl: M. Auger. An aqueous solution of potassium cyanide can be employed with advantage as regards yield in the preparation of the nitriles.—Aromatic alcohols. Some new reactions: R. Fosse.—Some new Euphorbiaceæ from central and western Africa collected by M. Auguste Chevalier: M. Beille.—Variations in *Papaver Rhoeas*: L. Blaringhem.—The existence of a peroxydiastase in dried seeds: Brocq-Rousseau and Edmond Gain. One or more peroxydiastases have been found to be generally present in a large number of dried seeds examined by the authors. This peroxydiastase does not exist in the seed indefinitely, but depends on the age of the seed.—The action of a magnetic field of high frequency on *Penicillium*: Pierre Lesage. In magnetic fields of high frequency the growth of the mould is accelerated, but this effect is indirect, since it is due, at any rate to a large extent, to the heating of the wires of the solenoid.—The origin of anthocyanine deduced from the observation of some parasitic insects of leaves: Marcel Mirande.—The marine migrations of the common trout: A. Cligny.—The parasitic castration of male star-fish by a new infusoria, *Orchitophrya stellarum*: Casimir Cépède.—The variations of the length of the intestine in the frog: Emile Yung.—The action on the heart of certain metallic ions introduced into the organism by electrolysis: Jean Gautrelet.—The presence of Schaudinn's treponemes in the appendix of a hereditary syphilitic fœtus: Ch. Fouquet.—The possibility of establishing a true diagnosis of death by radiography: Ch. Vaillant.—A case of modification of a *thalweg* by the intervention of a volcanic intrusion (Sardinia): M. Deprat.

December 23, 1907.—M. A. Chauveau in the chair.—The president announced the deaths of M. Janssen and Lord Kelvin.—Observation of the transit of Mercury across the sun, November 13–14, 1907, at the Observatory of Aosta, Italy: M. Amann. Times of the four contacts are given, with remarks on the formation of the black ligament, luminous point, and rings.—The compensation of an electromagnet compass for armoured blockhouses and for submarines: Louis Dunoyer.—Liquid dielectrics: Louis Maclès.—The conditions of maximum yield for telephonic apparatus: Henri Abraham and M. Devaux-Charbonnel. The problem attacked in the present paper is as follows. Accepting the telephonic apparatus at present in use, are the various elements, the transformer, the resistance of the bobbin of the receiver, &c., chosen so as to furnish the maximum effect in the transmission of speech? The theoretical investigation leads to the conclusion that the receiving instruments should have a resistance of 100 to 200 ohms, and the transformation ratio should be near 6 or 7. An examination of the transformers in actual use in telephone work showed an efficiency of only 60 per cent., and with this efficiency the transformers are too small for the work.—The application of the method of limiting densities to organic vapours:

Ph. A. **Guye**. From an examination of the experimental work of Ramsay and Steele on the densities and compressibilities of organic vapours, the author concludes that neither the parabolic extrapolations of Daniel Berthelot nor the graphical extrapolation of measurements of compressibility allows of the rigorous verification of the principle of limited densities.—The influence of temperature on the optical properties of dissolved bodies: C. **Chéneveau**. The index of refraction of a dissolved body varies only slightly with the temperature; the variation of the optical constant or the molecular refractive power of a dissolved substance under the influence of temperature appears to arise more especially from the change of volume of the solution, and appears to be produced in the same sense as the change of temperature.—The detection and estimation of nickel in the presence of any quantities whatever of cobalt, iron, and manganese: Emm. **Pozzi-Escot**. The nickel is precipitated as a double molybdate of nickel and ammonium. No test analyses are given.—The nature of some phosphorescent elements and meta-elements of Sir W. Crookes: G. **Urbain**. Starting with definite mixtures in varying proportions of pure terbium and gadolinium, the author has been able to reproduce many of the phosphorescent spectra attributed by Sir W. Crookes to separate elements.—A new chromium sulphate: Paul **Nicolardot**.—The influence of acids and bases on the fixation of acid and basic colouring matters on wool: L. **Pelet-Jolivet** and N. **Anderson**. Details of the amounts of an acid and a basic dye taken up by wool in presence of varying amounts of hydrochloric, sulphuric, and phosphoric acids are given, and it is claimed that the results are in accord with the hypothesis of contact electrification, and agree with the colloidal theory of dyeing.—Glycidic ethers and aldehydes in the naphthalene series: Georges **Darzens**.—An isomer of sparteine, isosparteine: Charles **Moureu** and Amand **Valeur**. A description of the preparation of the base, its dichlorohydrate, chloroplatinate, hydriodide, and picrate. It forms a bi-tertiary saturated base, and the methyl group is not attached to the nitrogen.—Observations on the formation of the aleurone grains during the ripening of the seed: J. **Beauverie**.—Observations on the production of chlorophyll in the higher plants at different luminous intensities: W. **Lubimenko**. An important fact which appears from this work is that the best illumination for the production of chlorophyll is lower than the maximum luminous intensity of daylight. A green plant can adapt itself to a feeble light by increasing its production of chlorophyll.—The constancy of composition of plant juices obtained by successive extractions: G. **André**.—The action of tyrosinase on some substances resembling tyrosine: Gabriel **Bertrand**. Only those substances examined which contain a phenolic hydroxyl group proved to be oxidisable by a solution of tyrosinase. The length and nature of the lateral chain appeared to have only a secondary influence, provided that the chain was not too strongly acid or basic.—The excitatory action of the internal branch of the spinal nerve on the stomach and pancreas: F. X. **Lesbre** and F. **Maignon**. The internal branch of the spinal nerve of the pig contains, not only motive fibres, but also secretory fibres, the centrifugal fibres of the vagus.—Does the radiography of the abdominal organs permit of the diagnosis of true death? M. **Béclère**. Although the radiography of the abdomen is capable of giving assistance in the differential diagnosis of apparent and true death, the results cannot be absolutely relied upon.—The physiological properties of tubercle bacilli which have been submitted to the action of chlorine: MM. **Moussu** and **Goupil**. These chlorinated bacillary products have distinctive toxic properties, easily appreciable in healthy subjects. The thermal reaction provoked differs from that of tuberculin.—Contribution to the study of the influence of traumatism on the localisation of tuberculosis. Results of articular traumatism in rabbits tuberculised by the digestive canal: S. **Rodet** and M. **Jeanbrau**.—The Allier in Miocene times. A deposit of Miocene vertebrates near Moulins: Ph. **Glaudeaud**.—The fossils near the tile works of Soumailles, in the commune of Pardailhan: G. **Vasseur**.—The Agout, a tributary of the Aude, and the valley of the Lhers mort: J. **Blayac**.—Researches on the variations of the terrestrial potential: Albert **Nodon**.

DIARY OF SOCIETIES.

FRIDAY, JANUARY 3.

GEOLOGISTS' ASSOCIATION, at 8.—On the Zones of the Chalk in the Thames Valley between Goring and Shiplake: C. P. Chatwin, and T. H. Withers.

MONDAY, JANUARY 6.

ARISTOTELIAN SOCIETY, at 8.—Prof. James's "Pragmatism": G. E. Moore.

VICTORIA INSTITUTE, at 4.30.—The Influence of the Glacial Period upon the Early History of Man: Rev. G. F. Wright.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—Preparation of Paratoluidine from mixed Toluidines by means of Paratoluidine Hydrate: R. J. Friswell.—The Determination of Small Quantities of Bismuth: H. W. Rowell.

WEDNESDAY, JANUARY 8.

JUNIOR INSTITUTION OF ENGINEERS, at 8.—Recent Improvements in Electric Conduit Traction Construction: Fitz Roy Roose.

GEOLOGICAL SOCIETY, at 8.—On the Application of Quantitative Methods to the Study of the Structure and History of Rocks: Dr. H. C. Sorby, F.R.S.—Chronology of the Glacial Period in North America: Prof. G. F. Wright.

THURSDAY, JANUARY 9.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Cost of Electrical Power for Industrial Purposes: J. F. C. Snell.

FRIDAY, JANUARY 10.

ROYAL ASTRONOMICAL SOCIETY, at 5.

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